



1030 - Victorian Railways Economy Passenger Carriage / Guards Van. (BCE)

Requires either 4 or 6 wheel bogies to complete.

Thank you for purchasing this kit and I hope you get many hours of enjoyment from it. Chris Pearce (Spirit Design)



3 BCE at the rear of a train; Spencer Street Station circa 1980. Photo courtesy Mel Skinner

Basic history notes: Based on the designs by Thomas Tait formerly of the Canadian Pacific Railway the 2nd class EBSV cars (Travelling Post Offices) were constructed to the same basic exterior like the other 'W' & 'E' cars. 7 were built in 1909 and 3 more in 1910. The coding was changed to BDSE and five of the cars were re-built into 'BE's in 1923. During the 1920's the Post Office abandoned the use of the cars and they were surplus to requirements until 1935 when a major refit saw them converted to 2nd class passenger/guards van combination incorporating a cupola style unit and were numbered BCE1-5. The underframes were altered to the centre sill gondola style (fish belly) utilising headstocks and side sills recovered from other surplus stock, and as a result, the familiar truss rods were not needed. There are some minor differences in the cars; one of the major ones is that the corridors of BCE4 and 5 are on the opposite side to BCE1-3. Seating capacity was 42 and guard's capacity was 9 tons. They could be seen throughout the VR and occasionally on the SAR systems and the entire class have survived into preservation and are regularly used of railfan specials by the various groups. The main colour carried was VR pass car red (different shades in various years) and the heritage buff-brown whilst in preservation on one occasion by Seymour Heritage Group.

The kit can be put together in under 3 hours total (when pre-painted) over a week. Only minimal tools and basic/intermediate skills are all that is required to build a very accurate model of a VR BCE passenger car. It is suggested that you read the instructions first to become familiar with the components and the essence of construction. There are a few steps that require close attention and they are highlighted in ***bold and italics!*** Parts referred to in the text are marked **P1, P2** etc.

Equipment & Materials:

Exacto knife (blade no 16 or similar), 800-grit aluminium oxide sandpaper, small flat needle file. Fast-drying wood glue like Triton PVA (which is sandable and goes off in under 5 minutes), Sellys 'Kwik Grip' water-based and super glue are the three required for completion (all recommended: usual disclaimers).

Assembly: *The kit sides and walls should be painted (see painting general notes below) before assembly with only minor touch-ups needed after assembly. The reasoning behind this is that it is easy to paint the window frames whilst the components are still lying flat in the lasered sheet. The roof, underframe and other components can be painted at any time. Any piece cut from the sheet should have the holding tag sanded slightly as there is always a slight bump when a knife cuts it free from the surrounding area. Also, become familiar with the prototype by studying the photos with the instructions before commencing the kit.*

Painting general:

The main laser etch should be ***lightly coated*** (2 passing light coats not 1 heavy one) with a pale grey primer, Tamiya Surface Primer is ideal for this step. This will enhance the top colours. Failure to do so will result in off looking colours. Windows: please use the 'QuickMask' provided to get excellent results with this easy to use product.

Sides, end walls and doors: Steam Era pass car red (preferred) or similar. Tamiya TS49 or TS8 for different red schemes if you cannot airbrush.

The window surrounds Moonstone grey (light grey (Humbrol 40) with a few drops of dark brown) or Tamiya AS-15 Tan UASF and Humbrol No 94 for touch-ups.

Roof: Humbrol Matt 29, pale grey for the 1960s

Vestibule end closures: Matt black, Floquil weathered black or grimy black

Underframe, Generator, air reservoir, truss rods and generator stitch panel and steps: Matt black, Floquil weathered black or grimy black

Painting the car sides, doors and windows with the 'QuickMask': *Note: The film is a light tack masking and can easily be repositioned with due care. You can cut the mask into 2 separate halves if it makes it easier.*

Once the sides, doors and windows have been painted in red, take a 'QuickMask' sheet and peel the Smokey grey adhesive vinyl off the backing paper and whilst doing this make sure the window inserts remain on the backing paper. If not use the edge of a knife to hold them whilst drawing the mask back. The bevelled corners of the mask should be positioned towards the top of the car/etch when being positioned.

Hold the far left and right ends of the masking between your thumbs and fingers, and place it over the side of the car whilst looking through the window cutouts for alignment. The top of the first row of window cutouts should be positioned so that edges match the window frames. You should now have a window frame exposed on two sides and a bottom for each window opening. The lower car should be the same also. ***No paint should be across the top of the window frame – see prototype photo above for reference.*** The alignment down the two sides and bottom of the window frames must be approx. 0.5mm open area for painting. Once in position, apply pressure on the film over the windows with your finger. Do not rub, as it may distort the fine lines between the window pairs. If necessary, gently coax the mask into position and if having trouble, trim the mask in half and lay down 1 car side at a time.

The car's windowpanes are now ready for painting. These should be sprayed with low pressure (i.e. airbrush), so as not to lift the mask off. A suitable colour in a spray can is also adequate. ***Note: When the paint has been applied, the resulted painted finish will resemble a squared bottomed "U" shape in the windowsills.***

Applying the paint should be done with various light passes, all-facing slightly towards the bottom of the car so as not to get paint bleed on the top of the windowsills. Two passes facing the left, two towards the right and two facing down should be adequate. Once the paint has been applied, wait about 30 seconds and gently peel the masking off and discard. Proceed with the assembly instructions below.

Assembly Instructions (Refer to plan at the end for part nos.)

1. Sand the MDF floor P1 edges ever so slightly to remove the minor laser staining and to make the edges are vertical. Turn the floor over so the markings 'BCE' and the 'U' shaped ones are facing the desk surface you are about to assemble on. These are the guides for the underfloor detail.
2. Turn the laser etch over and on the back rule a grey lead pencil line 2mm above the passenger windows. This will help you position the windows on or below this in the assembly further on.
3. Glue a carriage end wall P2 to the MDF floor keeping it square and vertical (See Photo 2 below).



4. Glue a small door P3 in behind each opening (**see a plan where the 3 is**) of a carriage side. Make sure each door sits symmetrically around its opening. Its best viewed from the front of the carriage side to aid positioning.
5. Glue double doors P5 behind each side P4 and P6. Again, make sure they are evenly spaced all around.
6. Glue a side P4 to the end wall edge P2 and against the MDF floor making sure the wall side covers the end wall edge. Also, make sure that the wall is the correct one for that side, i.e. there should be spaces in the MDF for door openings to match.
7. Glue the other end wall P6 to the above assembly making sure everything is straight and vertical.

8. Repeat procedure for other sidewall **P6** as above.
9. Glue **P7** carriage remaining wall to the other sides and end and MDF base. **Make sure is square. Note: The 2 remaining doors that are off centre will be vacant at this stage. See Photo 3 below.**



10. Glue **P8** to one of the inner walls **P10**, the notches will help position it. They should meet at 90 degrees.
11. Glue **P9** to the above-assembled unit, again making sure that they are at right angles. **P10** will be about 4 mm above the bottom of the door. Now glue the other **P10** into this unit. **See photo 4.**
Note: because of the timber thickness the window widths in the cupola are slightly narrower than the real-life unit. You can however file these at the left and right edges to increase the size once glued into the main body. This is suggested for experienced modellers only. The standard assembly still looks great if you leave it unmodified.



12. Glue the completed cupola section into the main body making sure that doors are centralised and that the edges of **P10** are not seen in the door openings. **Note Orientation of cupola to the main body is crucial. Looking at photo 3 above, the shorter side (notched part of the door assembly P9 of the cupola goes to the left-hand end of the main body. Photo 4 shows the correct orientation for photo3 above.**
13. Cut or snap the 2 prescribed 2 windows 8mm high x 62mm long from the clear celluloid. Use Selly's Kwik grip to glue these in behind the carriage sides. Make sure the glass sits below or is no higher than the scribed line you did at the start of assembly. Make sure that the glue does not creep into the area shown in the window proper. There should be a dab of glue between each set of window compartments.
14. Cut/snap off two 8mm x 13mm glass for the large guard's doors and glue into place. The glass should cover the window openings but not protrude above the door itself.
15. Cut/snap four-door glasses and glue them in behind the single doors and the window next to them that has not been covered as yet.
16. Cut/snap off two 8mm x 13mm glasses and glue these vertically inside the cupola.
17. Paint or glue a piece of Buff coloured paper behind the toilet window immediately to the right of the cupola window. Using the above photo, paint the 2nd window along with the cupola.

Note that the curvature edge of internal supports where they meet the side of the carriage should not protrude above the carriage side.

18. Glue the two inner end wall internal roof supports **P11** up against each end wall. There is a corresponding window hole in each unit that matches the end wall doors window. Test fit each piece before gluing.
19. Glue an internal support **P12** on each side of the cupola walls.
20. Glue **P12** internal supports between the double windows adjacent to the toilet window and between the 3rd and 4th sets of double windows. You can however position support in the middle of the 2nd set of double windows in your colour in the internal support with a RED '**Sharpie**' pen. This will give an even spacing between supports for the roof. **See photo 5 below as a guide.**



21. Glue the special-shaped internal support **P13** between the middle bars of the large doors as this will help support the roof section **P15**. **See Photo5 above.**
22. Add a minimum of 10 grams of weight to the carriage floor using lead, nuts or discarded wagon weights.
23. Test fit and file if necessary P13 roof piece. The B of BCE sits closest to the cupola end. Wet the back of the roof **P14** (ribbed side) with water and gently roll the ribbed sections over a 13mm rod or large Exacto knife. This will make it easier to glue the roof to the profile of the carriage. Glue the roof **P13** to the carriage by placing glue along the sides, ends and partitions **P11/P12** supports and centrally locate the roof so that there is a slight even overhang around the carriage sides. See prototype photos below. **Note that the ribs/corrugations face the inside of the coach, i.e. plain roof side faces you.** Wipe away any excess glue. The roof can be secured in place with the aid of rubber bands supplied with the kit. Put these over the end sections and inner plywood **P11/P12** support areas as they can support the downward force of the rubber bands.
24. Complete the same process for **P15**. Once dry very lightly sand the roof sections with 600 grade or similar sandpaper producing a silky smooth feel.
25. Glue the underframe **P16** to the MDF floor. The two 'U' shaped markings are a guide to centralising it. **Note the underframe is slightly longer than the MDF floor and is fractionally shorter than the overall length of the carriage sides and ends as a glued unit.**
26. **Once the roof is dry GENTLY file where the roof meets a wall and a corner. File strokes away from the corner and up towards the apex of the roof and not down over the sides (away) or you will splinter the edges of the walls.** You can also put a little putty in each of the corners to lessen the filing needed. Then lightly sand the roof surface with very fine sandpaper (800grit or above) to remove the very slightly fuzzy feel of the wood.



27. Glue the underframe **P16** to the MDF floor making sure that the body toilet windows face you and that the underframe with the 2 markings for the battery box is on the RHS of the middle when turned over. The two 'U' shaped markings are a guide to centralising it. Using the parts plan below glue the underframe as per the Passenger end. Battery box score marks point to the front of the carriage. *Note the underframe is slightly longer than the MDF floor and is fractionally shorter than the overall length of the carriage sides and ends as a glued unit.*
28. Glue a 135mm 'U' channel (North Eastern wood channel supplied) up against the edge of the plywood underframe. One piece for each side. The 'U' faces you when looking at the carriage from side-on.
29. Glue the larger clerestory section side **P18** with its base unit **P17** making sure that the **P18** is glued centrally towards the top (rounded corners) of the **P18**. Repeat the same with the smaller clerestory sections **P20, 21, 22**.



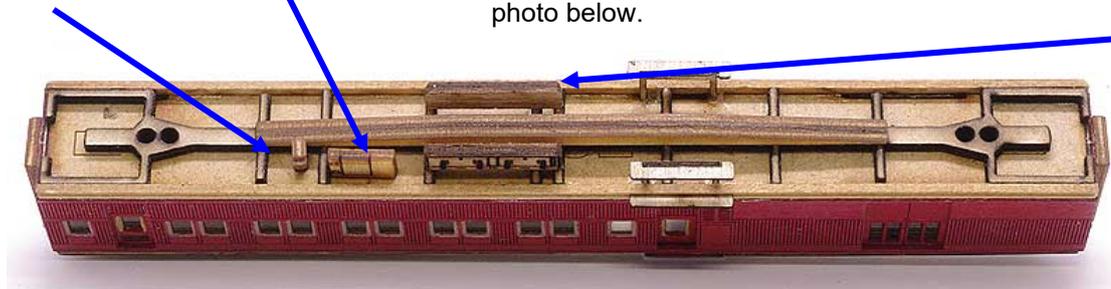
30. Glue the completed larger assembly unit of the clerestory to the passenger end roof making sure that it is straight along the middle of the roof towards the cupola end. Repeat the same for the smaller unit.



31. Glue the end wall vestibules **P23** onto the end wall doors. Use the outline on the carriage end wall as a guide.
32. The roof P24 is the hardest part of the kit to assemble. Using a small jeweller's screwdriver as a forming tool gently round over the 1st 5mm or so of the styrene clerestory roof section tops of **P24**. This will aid in

the styrene following the contour of the clerestory roofline when gluing. Test fit the styrene roof **P24** larger section to the clerestory **making sure the side with the scored line faces up**. Gently round the ends over further to match the shape of the clerestory and when happy glue the first edge that meets the end wall above the door with super glue and hold this until dry. **(Note make sure P24 has an even overhang along the entire roofline section of the clerestory unit)**. Using either superglue or another suitable alternative, glue the rest of the roof down until it meets the cupola. Repeat for the other smaller section. Don't worry if there is a small gap between the roof halves as this can easily be filled with Tamiya putty or a similar product. I decided that it would be easier if the roof were in two sections after building the 2nd unit. Glue the smaller section down. Gently coax the cupola roof curved sections into place. This may take some time to adhere the sections down. As this is the hardest procedure and mistakes can be made a 2nd roof is included.

33. Fill any gaps with body putty where the two roof halves meet. Sand smooth when dry.
34. Using the thin styrene strip cut a 69mm piece and glue it long the scribed line of the passenger end roof portion. Repeat the same for a 47mm piece for the shorter roof section.
35. Using the 0.4mm 3 ply cut the water fill and ice hatches and glue them in place where the corresponding scribed lines on the roof are.
36. Trim and insert the cast torpedo vents into the holes on the passenger end roof and the hole in the clerestory section above the toilet window.
37. Glue both halves of the fish belly part of the underframe together **P25** and then glue the completed assembly evenly spaced between the bogie screw holes.
38. Next glue the two battery boxes **P26** across the scribed lines. These are towards the passenger end.
39. Looking underneath glue **P27** as per the photo.
40. Glue **P28** across ways in front of **P27** but over the other side of the underframe cross member. Use the photo below.



41. **P29** consists of two parts. Glue the step tread to the 'U' shaped bracket. Make sure the bracket and the tread are 90 degrees to each other. The step should be the glue to cover the thickness of the bottom part of the 'U', i.e. apply glue to the stepped back section of the step, lay flat and stand the bracket up against it. Glue the completed assembly to the underframe using prototype photos as a guide.
42. Glue **P30** single steps into the 'U' channel above the P29. See the photo above for positioning.

Decals: Using the prototype photos and the photo of the finished model, position the decals accordingly.

Weathering: Use pastels or paint to weather the carriage as per photos or to your liking. Do not forget the roof as smoke and diesel fumes stained it.

Bogies: Microtrains 1018 6-wheel bogies or equivalent can be used. An M2 or similar countersunk screw in the 2nd hole of the bogie will provide the correct spacing. The other hole is for 4 wheel bogies if you have no others.

Couplers: Fit couplers using **P31** timber shims from the laser etch as the packing bits. Micro-Trains 1015's are a good choice.

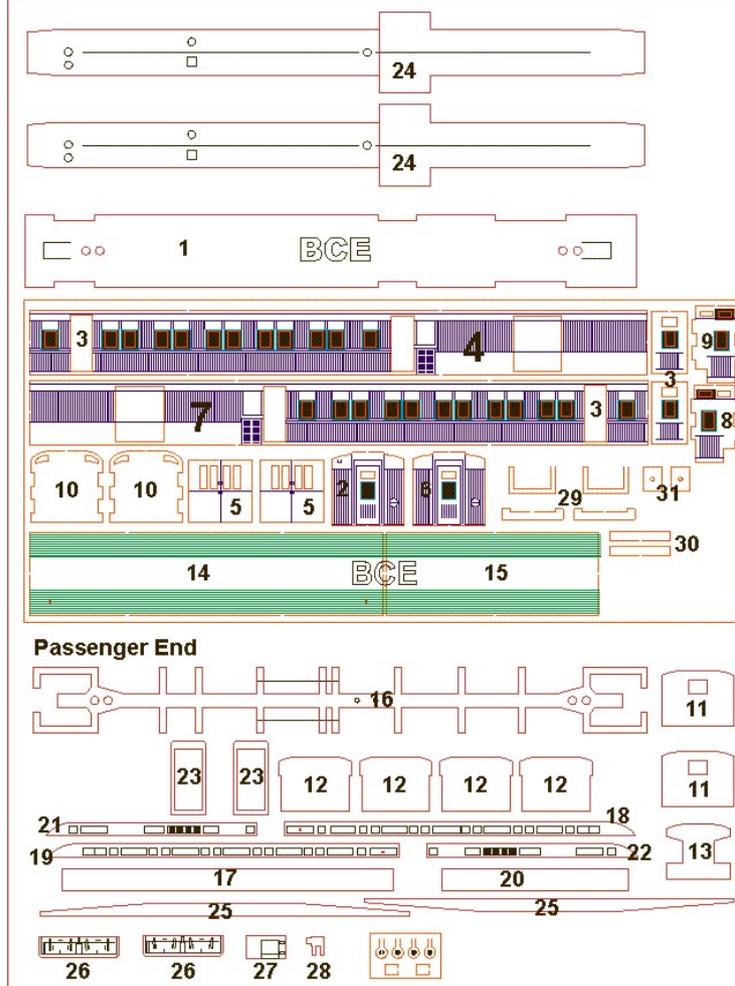




5BCE awaits departure on a down passenger train Spencer Street Station circa 1980. Photo courtesy of Mel Skinner.



Weathered finished kit.



For more information and photos see www.spiritdesign.com.au, Rob O'Regan's website <http://www.robx1.net/> or Mark Bau's <http://www.victorianrailways.net/> or Peter Vincent's <http://www.pjv101.net/index.htm>.

Any alterations, suggestions or queries please contact me.

Email chrisspearce@spiritdesign.com.au

Spirit Design ABN 92 510 718 068

www.spiritdesign.com.au